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ABSTRACT

This study examined faculty support for programs that aid minority engineering students. A survey was designed and mailed to faculty at 112 randomly-selected engineering schools. A total of 91 faculty from 30 schools completed the survey. The study found that although there was general support for minority engineering programs (MEPs), there was great variability among the responses. Greatest support was found for financial and academic types of assistance, with less support for clustering of activities. The study also found that faculty from state schools, larger schools, and from schools located in the Midwest tended to give greater support to MEPs than faculty from private schools, smaller schools, and schools located in the East. A copy of the survey questionnaire is appended. (MDM)

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Faculty Support for Minority Engineering Programs

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Abstract

A survey was developed and mailed out to a random sample of engineering professors at schools across the country with ABET-accredited (Accreditation Board for Engineering and Technology) programs, asking them to assess the "value and appropriateness" of the existence of a formal, structured, general Minority Engineering Program in their School of Engineering, along with the following seven MEP-specific components: MEP student associations, scholarships, study centers, summer bridge programs, special tutoring programs, career fairs, and awards banquets. On a scale of 1-10 (1 = Very low, should not exist at all; 10 = Very high, critical), the engineering professors tended to express general endorsement of MEP's considering the middle of the scale (5.5) represents a neutral position and the sample average was 6.51. However, there was considerable variability (SD=3.13). Greatest support was found for financial and academic types of assistance, with less support given to clustering-types of activities. In addition, attitudinal differences between types of institutions (public vs. private; research vs. non-research), size, and location of schools were explored. State schools yielded higher scores than private; regionally, the Midwest was the highest and the East was the lowest; and in terms of size, we found that the larger the school, the higher the score. Finally, open-ended comments were analyzed as a qualitative component to shed light on the numerical results.

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Introduction

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Our country is suddenly making a political "about-face" with respect to the practice of "affirmative action." News media seem to be routinely reporting that there is discontent with the idea. Political leaders are calling for its complete dissolution. Current President Clinton wants to move from "quotas" to "preferences." Glynn Custred and Thomas Wood co-authored the *California Civil Rights Initiative* included on the November 1996 ballot. But if you listen to opponents of affirmative action carefully, the

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content of their message often appears to reflect more frustration with a few aspects of the practice, rather than the entire concept. Few people seem to deny that **there is still a problem in our country with respect to achieving educational and professional equity across all races.** Fewer still deny the historical (unfair) basis for these disparities. So it would seem then, that to completely abolish all related support to ethnically under-represented populations would subscribe to the cliché of "throwing out the baby with the bath water." The question that this study seeks to address is: How should affirmative action be defined today in the context of college engineering programs?" (Unfortunately, the phrase "affirmative action" may well be on its way out as the latest negative "catch phrase" in need of a euphemistic new name for what many still consider to be a valuable practice.)

Literature Review

History Affirmative action was developed in two phases. The first phase was the Civil Rights Act of 1964 which prohibited discrimination because of race, color, religion, or national origin (Graham, 1992, p. 51). The second phase was a shift during the Nixon administration toward minority preferences (Ibid, p. 50). Title VII galvanized these preferences by creating the Equal Employment Opportunity Commission to police job discrimination in commerce and industry (Ibid, p. 52). [A related subsequent development was the formation in 1966 by feminist leaders of NOW -- National Organization of Women (Ibid, p. 55).] Notwithstanding all these developments, many people continued to feel despair, perceiving a lack of effectiveness or progress. Thus, in 1970 the Labor Department began requiring all federal contractors to submit written affirmative action plans including numerical goals and time tables for achieving approximate proportional representation for minorities in the area work force (Ibid, p. 59). This practice was perceived by many as successfully forcing the desired changes. So in 1972, Congress extended the EEOC's jurisdiction to state and local governments and educational institutions (Ibid, p. 60). This led to activities such as school desegregation busing and selective college admissions by ethnicity. For example, in 1973 a federal court ordered 19 southern and border states including Ohio and Pennsylvania to enroll more Blacks in historically white schools (and more whites into historically Black state colleges) (Orlans, 1992, p. 145).

Affirmative Action -- Yea or nay? Affirmative action has always been a controversial policy in its attempts to combat differences between groups in earnings and employment (Coate & Loury, 1993, p. 1220). Many argued in its earliest days, for example, that the Civil Rights Act and the Title VII "minority preferences" bill directly conflicted with each other. President Johnson addressed the subject, speaking to the graduates at Howard University's commencement one year after the Civil Rights Act of 1964 was passed:

> You do not wipe away the scars of centuries by saying: Now you are free to go where you want, and do as you desire... You do not take a person

> who, for years, has been hobbled by chains and liberate him, bring him to the starting line of a race and then say, "You are free to compete with all the others," and still justly believe that you have been completely fair... We seek... not just equality as a right and a theory but equality as a fact and equality as a result (Public Papers, 1965, p. 636).

More recently, California voted in 1996 in favor of Proposition 209 which, if permitted by the courts, would virtually eliminate all forms of affirmative action. Just prior to this, the University of California Board of Regents voted 14-10 to drop race-based admissions at the nine-campus system, and 15-10 to halt affirmative action hiring. Keith Orlando Hilton called this "Politics, Not Pragmatism" in an article published in *Black Issues in Higher Education*.. Hilton notes the University of California initiative author argues that "preference programs have a racially polarizing effect..." (Hilton, 1995, p. 7) He also quotes then-governor Pete Wilson, "Are we going to treat all Californians equally and fairly? Or are we going to continue to divide Californians by race?" (Ibid) On the other side of the debate, Carolyn Murray, associate professor at UC Riverside pointed out that "UC is a land-grant institution, and land-grant institutions were designed to meet the needs of the surrounding community. This is a clear violation of the original mission." (Ibid, p. 8)

So how well has affirmative action been working, and how well is it working today? Frank McCoy writes in the Black Enterprise that "during the past quarter century, the most important component in 'leveling the playing field' and providing equal access to those opportunities has been affirmative action" (McCoy, 1994, p. 54). McCoy argues that affirmative action is critical for encouraging qualified African Americans to "take positions in fields or areas from which they've been excluded or are under-represented" (Ibid, p. 54). Stephen Coate and Glenn C. Loury conducted economics-oriented research from which they concluded there are positive as well as negative effects of affirmative action today: "There are circumstances in which affirmative action helps minorities obtain opportunities to eliminate negative stereotypes; however, there are other circumstances in which affirmative action propagates negative stereotypes, promulgating the perception that minorities are hired without proper qualifications, and are given less work because of this" (Coate & Loury, 1993, p. 1239). Harold Orlans reports a negative charge in the educational context that, "at elite colleges, mediocre minority students are patronized and suffer anxiety and self-doubt they would not feel at less selective colleges and that lowered standards stigmatize able minority students who do not require them." Members of both minority as well as majority populations have argued at times that affirmative action was inherently flawed for reasons like this. (Orlans, 1992, p. 146)

More recently, the affirmative action debate took on a more positive spin as many in industry embraced "workforce diversification," as an impetus behind affirmative action practices. Industry has been reporting that employees with different backgrounds (e.g., culturally), bring different strengths to the company for an overall composite

improvement. Further, the broader cultural representation is also believed to be "good business" by appealing to and attracting more culturally "like clients."

How Long? A part of Dr. Martin Luther King's famous "I Have a Dream" speech reads:

> I have a dream that my four little children will one day live in a nation where they will not be judged by the color of their skin, but by the content of their character."
>
> Martin Luther King, Jr.
> (Washington, DC, August 1963)

The question has long been, "When will that 'one day' arrive and how will we know?" The more immediately-germane question is, "How long should affirmative action continue to be employed toward this goal and in what forms?" Affirmative action was originally conceived as being a ten-year fix (Graham, 1992, p. 50). Today, three decades later, it is in fact being heavily challenged as more detrimental than beneficial. Coate and Loury question "whether the labor market gains (which affirmative action brings) can continue without (affirmative action) becoming a permanent fixture in the labor market" (Coate & Loury, 1993, p. 1220).

Minority Engineering Programs Acknowledging the need for an excellent and large engineering workforce for the prosperity of our country, numerous reports have been written expressing concern over predicted shortfalls of engineers. One such article, sponsored by the National Governors' Association, predicts that by the year 2010, the United States could suffer a shortfall of as many as 560,000 science and engineering professionals. (McDonald, 1989, p. 8) With our changing demographics showing increasing proportions of minority populations, the consensus in these reports by and large is that more should be done to assist and encourage minorities to pursue the engineering field. Likewise, women have always been poorly represented in engineering, and are consequently targeted as well by these recommendations. This same article reports that "Black students receive 2.9 percent of the undergraduate engineering degrees, while Hispanic students comprise 2.4 percent..." with female students composing 16 percent. (Ibid)

NACME (National Action Council for Minorities in Engineering, Inc.) reviewed engineering student performance in 118 individual institutions. They found that 35.6 percent of minority freshman engineering majors had obtained a bachelor of science while the rate for non-minorities was 68.4 percent. (Campbell, 1991, p. 1) The disparity is clear, beckoning many to seek improvement.

One specific Minority Engineering Program tool is increased financial aid. This was challenged in 1990 as illegal under the *Bakke* court case, but subsequently left alone. The Office of Civil Rights reported that since the founding of the Department of Education in 1980, it had had less than a dozen complaints on minority scholarships.

"This indicates to me that there wasn't much of a problem with minority scholarships," wrote Antonio Califa, director of legislation for the American Civil Liberties Union. (Ridgely, 1992, 115)

Julia Ridgely covered a debate over several of the most contested legal issues affecting minority participation in higher education. She wrote, "Debates over racial issues often come down to a question of balance. At what point does trying to remedy historical inequities for one group infringe on the rights of another?" (Ridgely, 1992, 13) In this paper, we seek to address this issue within a specific context: What are valuable and appropriate affirmative action support features for engineering students? Our findings are based on the viewpoints/opinions of the people closest to the students' educational process -- their professors.

"Color blind" -- Good or Bad??

Is it good or bad to be figuratively color blind? The original Civil Rights Act of 1964 supported non-discrimination under a "race-blind constitution." "Color blind" was later noted by culturally sensitive groups to be a derogatory term. Instead, people were admonished to appreciate different value sets by people of different backgrounds or cultures. Supporting related analogies have comprised:

Salad Bowl: Opposes the "melting pot," encouraging individual cultures to maintain their heritages and compliment other cultures harmoniously, just as a tomato co-exists and compliments carrots in a garden salad.

Platinum Rule: Do unto others as they would have you do unto them.

Now, all of a sudden, politicians are returning to the derogatory use of the phrase to argue that such decisions as hiring and college admissions should be based on merit alone.

Method

Instrumentation. A survey instrument was developed by listing components commonly found in Minority Engineering Programs across the country. The format allows respondents to rate each using a 10-point Likert scale indicating how much they value and feel the component is appropriate at their institution (1 = Very low, should not exist

at all; 10 = Very high, critical; see Appendix A).

The survey was then administered to the engineering faculty at the University of the Pacific. The results and conclusions were subsequently reported back to the school. That no disagreement was found provides some evidence of the instrument's validity.

Finally, the survey was mailed to 112 (out of 274) randomly-selected engineering schools/programs across the country which offer at least one ABET-accredited (Accreditation Board for Engineering and Technology) engineering degree. We asked each school's engineering dean to administer the survey to ten randomly selected faculty, and to then return them along with the completed questionnaire from the Dean which describes their school (i.e., size, type, location, and whether they had an MEP).

Descriptive statistics (including means and standard deviations) were calculated for each item based on all respondents combined. In addition, these statistics were broken down by funding type (public vs. private; research vs. non-research), size (<400, 400-1,400, >1,400 students), and location (west, mountain, midwest, east, and south) of the school.

Sample. Out of the 112 schools contacted, 191 professors from 30 schools responded to the survey. The characteristics of the schools being represented and the number and percentages of professors from each are shown in Table 1.

Although we do not have background information about the three schools from which 25 professors responded, the table shows that at least 17% are associated with engineering programs where the student body is smaller than 400. At least 23% are at engineering schools with more than 1400 students. Most of the professors who responded to the survey teach in engineering programs enrolling between 400 and 1,400 students. The professors came from a minimum of eight small, eleven medium, and eight large schools.

The majority of professors (at least 56%) who responded are at state schools, some of which they consider to be "research" institutions. At least 30% are at private institutions; again, some of these are private "research" institutions.

The geographical region in which a school of engineering is located was reported by the deans. In a few instances, schools within the same state were not considered to be in the same region. Nevertheless, all regions are represented (three schools in the West, three from the Mountain States, three from the South, seven from the East, and eleven from the Mid-West). Correspondingly, most responding professors were from the Mid-West or Eastern regions.

The majority of the professors responding (64.4%) were from colleges which have

formal Minority Engineering Programs. About nineteen percent were not, and about seventeen percent did not report whether their college had a Minority Engineering Program. From this, we can estimate that 77% of the professors responding were from schools with MEP's, implying increased familiarity with MEP programs.

While it is recognized that only 27% of the schools invited to participate actually responded to the survey, it can be noted that the professors who did complete it are affiliated with a variety of sizes, types, and locations of engineering programs.

Table 1.
Description of Professors and their Schools Who Responded

	Professors		Schools	
Size of School[c]	***n***	**%[a]**	***n***	**%[b]**
Small (<400)	34	17.8	8	26.7
Medium (400-1,400)	87	45.5	11	36.7
Large (>1,400)	45	23.6	8	26.7
Type of Institution[d]				
Private	57	29.8	10	33.3
State	108	56.5	16	53.3
Research	29	15.2	5	16.7
Location of University				
West	19	9.9	3	10.0
Mountain	20	10.5	3	10.0
Mid-west	78	40.8	11	36.7
East	29	15.2	7	23.3
South	20	10.5	3	10.0

a The percentages are based on the total of 191 professors and within attributes (size, type, and location) do not sum to 100% because information was not reported in 25 (or 13.1% of the) cases, representing three schools.
b The percentages are based on 27 schools.
c Based on engineering student body.
d The categories are not mutually exclusive (e.g., there were professors from private research schools who responded).

Results

Based on all respondents combined. In assessing the value and appropriateness of the existence of a formal, structured, general MEP, faculty members expressed general endorsement (M=6.51) although there was considerable variability (SD=3.13). As shown in Table 2, responses to the first item on the questionnaire ranged from 1 through 10 covering the entire scale. With "5.5" defining the most neutral possible choice (by virtue of falling in the middle of the respondents' scale of possible choices), there is evidence to suggest engineering professors support MEP's, t (183)=4.38, $p<.001$.

Table 2. Frequency distribution of responses to the general question concerning the value and appropriateness of the existence of a formal, structured, general Minority Engineering Program in the professors' own school of engineering.

Rating	Frequency	P
1	22	12.0
2	9	4.9
3	12	6.6
4	9	4.9
5	11	6.0
6	13	7.1
7	14	7.7
8	25	13.7
9	31	16.9
10	37	20.2

Note: Eight professors did not respond to this item (n=183)

The value and appropriateness ascribed by professors to MEP's in general and the various components are presented in Table 3. The summary statistics show that MEP scholarships, summer bridge programs, special tutoring programs, and MEP constituent student associations are more highly endorsed and that faculty viewpoints are less variable with respect to these components than others. One sample t-tests comparing the sample means to the hypothesized neutral position (a rating of 5.5) reveal that these four components range from .59 to 1.96 points higher. The other three components fall just .02 to .32 below the neutral point.

Table 3. Responses to the questions concerning specific MEP components.

Item #	Component	n	M	SD	t
1	General (overall)	184	6.51	3.13	4.38 **
2	Student clubs	183	6.09	3.10	2.57 *
3	Scholarships	181	7.46	2.64	9.98 **
4	Study center	175	5.25	3.07	-1.07
5	Summer bridge	178	7.38	2.63	9.51 **
6	Tutoring	180	6.84	2.85	6.33 **
7	Career fair	165	5.48	3.12	-.09
8	Awards banquet	165	5.18	3.22	-1.30

* $p<.05$ ** $p<.01$

Based on groups of respondents whose institutional size and funding vary. To investigate whether ratings varied systematically with size of the engineering student body and funding of the institution with which the professor is associated, two-way Analyses of Variance (ANOVA's) were performed. Table 4 presents descriptive statistics for responses to the first question, "General Minority Engineering Program." Size was not a significant factor, but funding was, $F(1,139)=5.33$, $p=.022$. The interaction between the two factors approached significance, $F(2,139)=3.01$, $p=.052$. The pattern of the mean differences suggests that professors from state-funded institutions tend to value MEP programs and find them more appropriate at their institutions than do those at private ones ($M=7.08$ versus $M=5.91$, respectively).

Table 4. Ratings on "General Minority Engineering Program" for professors at state vs. privately-funded institutions by size of engineering school student body size.

Size	State			Private		
	M	*SD*	*n*	*M*	*SD*	*n*
Small (<400)	8.60	2.37	10	5.18	3.02	22
Medium (400-1,400)	6.63	2.97	65	6.42	3.66	19
Large (>1,400)	7.55	2.77	31	6.42	3.06	12

The value and appropriateness of MEP constituent student associations (based on gender or ethnicity) did not systematically vary as a function of either size nor funding (see Table 5). However, the interaction between the two factors approached significance, $F(2,139)=2.94$, $p=.056$. Differences between professors at state-versus privately-funded institutions were more pronounced when engineering student body size was smaller.

Table 5. Ratings on "MEP Student Associations" for professors at state vs. privately-funded institution by size of engineering school student body size.

Size	State			Private		
	M	*SD*	*n*	*M*	*SD*	*n*
Small (<400)	6.10	3.60	10	4.91	3.19	22
Medium (400-1,400)	6.02	2.89	66	7.63	2.48	19
Large (>1,400)	7.16	3.10	31	7.10	1.52	10

With respect to MEP scholarships a highly significant interaction was discovered between size and funding, $F(2,139)=9.37$, $p<.001$, although no main effects approached significance. In Table 6 it can be noted that professors at state-funded small schools value the MEP scholarships component more than those at privately-funded small schools. This pattern reverses among professors at mid-sized schools. Funding is not a factor when professors at large schools are compared on this component.

Table 6. Ratings on "MEP Scholarships" for professors at state vs. privately-funded institution by size of engineering school student body size.

Size	State			Private		
	M	*SD*	*n*	*M*	*SD*	*n*
Small (<400)	8.80	1.48	10	6.36	2.82	22
Medium (400-1,400)	6.79	2.79	66	9.00	2.19	19
Large (>1,400)	8.58	1.93	31	8.10	1.29	10

The value and appropriateness of MEP student study centers was related to funding, $F(1,139)=4.54$, $p=.035$, but not to size nor an interaction between the two factors (see Table 7). Specifically, state-funded institutions tend to value MEP student study centers and find them more appropriate at their institutions than do those at privately-funded ones ($M=5.82$ versus $M=4.66$, respectively).

Table 7. Ratings on "MEP Student Study Centers" for professors at state vs. privately-funded institution by size of engineering school student body size.

Size	State			Private		
	M	*SD*	*n*	*M*	*SD*	*n*
Small (<400)	6.70	3.40	10	3.73	2.60	22
Medium (400-1,400)	5.19	2.95	62	5.21	2.49	19
Large (>1,400)	6.83	3.11	30	5.78	2.99	9

Both with respect to summer bridge programs and special tutoring programs, professors from institutions of varying sizes and funding sources did not systematically differ in their ratings of the value and appropriateness of these two MEP program components. Descriptive statistics are presented in Tables 8 and 9, respectively.

Table 8. Ratings on "MEP Summer Bridge Programs" for professors at state vs. privately-funded institution by size of engineering school student body size.

Size	State			Private		
	M	*SD*	*n*	*M*	*SD*	*n*
Small (<400)	7.50	3.06	10	6.64	3.02	22
Medium (400-1,400)	7.48	2.62	61	6.95	2.17	19
Large (>1,400)	8.26	2.39	31	8.00	1.56	10

Table 9. Ratings on "MEP Special Tutoring Programs" for professors at state vs. privately-funded institution by size of engineering school student body size.

Size	State			Private		
	M	*SD*	*n*	*M*	*SD*	*n*
Small (<400)	7.50	3.75	10	5.36	2.98	22
Medium (400-1,400)	7.15	2.53	65	7.16	3.02	19
Large (>1,400)	7.63	2.36	30	7.80	2.04	10

The value and appropriateness of MEP career fairs was related to size, $F(2,128)=3.62$, $p=.030$, but not to funding nor an interaction between the two factors (see Table 10). Specifically, professors at larger institutions tend to value MEP career fairs and find them more appropriate at their institutions than do those at mid-sized ones ($M=6.75$ versus $M=5.28$, respectively).

Table 10. Ratings on "MEP Career Fairs" for professors at state vs. privately-funded institution by size of engineering school student body size.

Size	State			Private		
	M	*SD*	*n*	*M*	*SD*	*n*
Small (<400)	7.10	3.51	10	5.00	3.07	21
Medium (400-1,400)	5.54	3.03	59	4.31	2.24	16
Large (>1,400)	6.64	3.16	28	7.13	2.64	8

With respect to MEP awards banquets a highly significant interaction was discovered between size and funding, $F(2,128)=3.95$, $p=.022$), although no main effects approached significance. In Table 11 it can be noted that professors from state-funded, small institutions value MEP awards banquets more than those from privately-funded, small schools. The opposite pattern is found among larger schools.

Table 11. Ratings on "MEP Awards Banquets" for professors at state vs. privately-funded institution by size of engineering school student body size.

Size	State			Private		
	M	*SD*	*n*	*M*	*SD*	*n*
Small (<400)	7.10	3.67	10	4.90	3.18	21
Medium (400-1,400)	4.80	3.16	54	7.05	2.99	19
Large (>1,400)	5.18	3.16	28	5.90	2.42	10

Based on groups of respondents from research- vs. non-research focused institutions. To investigate whether ratings varied systematically between professors from institutions considered to be research- or non-research-oriented, one-way ANOVA's were performed. Consideration was given to running 2-way ANOVA's incorporating size as a second factor, but there were virtually no small research-oriented institutions making it impossible to evaluate the interaction. Two-way ANOVA's were performed using professors from mid- and large-sized institutions which varied in their emphasis on research. However, no significant interactions were found, and those results are not discussed further.

Table 12 presents descriptive statistics for responses to the eight questionnaire items along with two independent sample t-test results. Only with respect to MEP career fairs was the value and appropriateness found to vary systematically between groups, $t(140)=2.49$, $p=.014$. Specifically, professors from non-research institutions tended to value and view MEP career fairs as more appropriate at their institutions than professors from institutions self-described as being research-oriented.

Table 12. Comparing responses of professors from research-oriented and non-research-oriented institutions.

Component	Non-Research			Research			
	n	*M*	*SD*	*n*	*M*	*SD*	*t*
General MEP's	130	6.65	3.06	29	6.86	3.17	-.33
MEP Associations	129	6.45	2.97	29	5.93	3.12	.84
MEP Scholarships	129	7.47	2.59	29	7.93	2.70	-.85
MEP Student Centers	125	5.62	3.06	27	4.63	2.78	1.54
Summer Bridge Programs	235	7.50	2.65	28	7.43	2.27	.12
Tutoring Programs	239	6.92	2.75	27	7.70	2.70	-1.35
Career Fairs	119	6.02	3.03	23	4.30	2.91	2.49 *
Awards Banquets	114	5.31	3.08	28	5.93	3.68	-.83

*$p=.014$

Based on groups of respondents from institutions located in different geographical regions. To investigate whether ratings varied systematically between professors from institutions located in different geographical regions, one-way ANOVA's were performed. Table 13 presents descriptive statistics for responses to the eight questionnaire items along with one-way ANOVA test results.

No regional differences were found with respect to the value and appropriateness of MEP constituent student associations, MEP scholarships, MEP student study centers, summer bridge programs, nor MEP career fairs. However, the value and appropriateness ratings of the MEP awards banquet compcnent did differ between regions. Specifically, Tukey multiple comparison tests reveal that the professors from institutions claiming to be in the mountain region rate the awards banquet component

significantly lower than professors from the midwest and southern regions.

Regional differences were also observed for the rating dealing with support of MEP's in general. Specifically, the professors from the midwest institutions rated the first item higher than those from the east.

Table 13. Comparing regional differences of professors.

Component	Means						
	West	*Mountain*	*Midwest*	*East*	*South*	*F*	*P*
General MEP's	6.00	6.26	7.50	4.96	7.10	4.14	.0032
MEP Associations	5.11	5.89	6.81	6.14	6.65	1.45	NS
MEP Scholarships	7.26	7.16	7.85	6.82	8.20	1.26	NS
MEP Student Centers	4.16	5.70	5.52	5.31	6.39	1.37	NS
Summer Bridge Programs	6.68	8.05	7.61	7.04	7.89	1.08	NS
Tutoring Programs	5.79	6.95	7.51	6.36	7.79	2.38	NS
Career Fairs	5.22	5.00	5.45	6.12	7.25	1.87	NS
Awards Banquets	5.56	3.29	6.15	4.50	6.16	3.73	.0065

Discussion

Table #1: Evaluation By Engineering Faculty

Perhaps the single most interesting finding is the very first datum in Table #3: The average value ascribed to Minority Engineering Program's in general by faculty is 6.51. With "5.5" defining the most neutral possible choice (by virtue of falling in the middle of the respondents' possible choices), 6.51 demonstrates a clear level of favorable support for MEP's. It was somewhat predictable that this number would fall somewhere between 3.0 and 7.0 (considering the variance in related political positions currently reported across the country, which is in fact reflected in the substantial standard deviation of 3.13, as well as the high frequency reported in Table 2 of respondents giving a rating of 1, 2, and 3). The fact that it was so close to 7.0 is somewhat surprising, and should be encouraging for proponents of the programs.

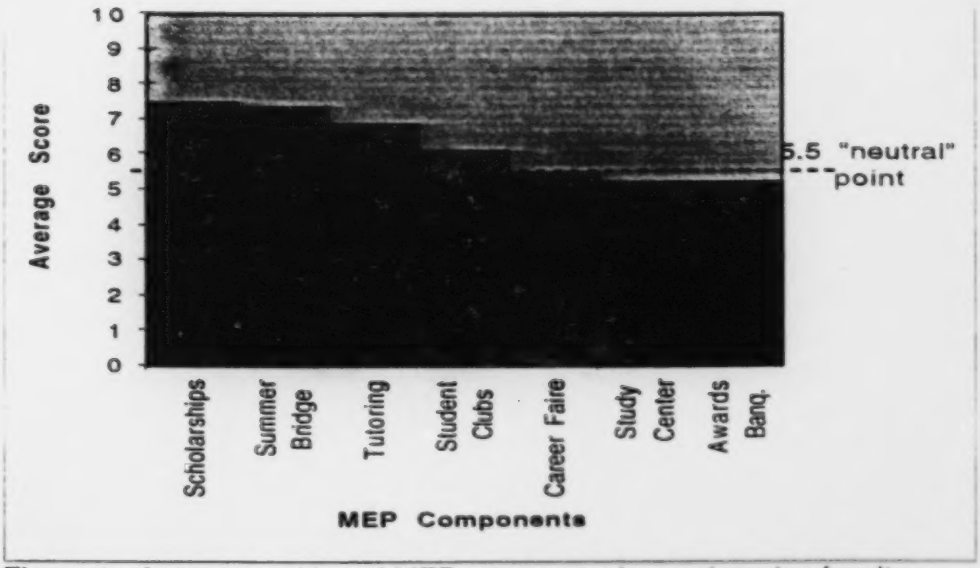

Figure 1. Average ranking of MEP component by engineering faculty.

Scholarships, summer bridge programs, and tutoring programs were higher, while study centers, awards banquets, and career fairs fell lower than the neutral point of 5.5. In talking with a few respondents, an explanation for this might be the sentiment that financial and academic empowerment types of activities are appreciated while "segregating" or "clustering" types of activities are coming to be viewed less favorably. To quote one respondent, "I believe that we should (offer) special scholarships, summer bridge, and tutoring programs. However, as far as student associations, career fairs, and awards banquets, (students) should be encouraged to enter the mainstream (i.e., rainbow society)."

Many citizens of the United States are clearly taking a careful look at what types of affirmative action programs are appropriate today. Many others remain strongly supportive. This may be reflected foremost in the large standard deviations of the above results. The range for every single question in every single category reached both extremes of "1" and "10." Examples of this were also found in the respondents' survey comments. One person wrote, "special 'handling' and 'advantages' due to minority status are never fair, and should be eliminated." Another wrote, "I believe minority students should be given the educational opportunity to compete on the same level as everyone else. If this means special classes and remedial training, fine."

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To the extent that influence from engineering professors is warranted in program guidance, college administrators could conclude that MEP's, in general, should definitely exist in American engineering schools. As these schools debate the evolution of their Minority Engineering Programs, they should perhaps give more consideration to providing financial assistance and academic support such as through scholarships, summer bridge programs, and tutoring programs. And while clustering programs (e.g., MEP study centers, awards banquets, and career fairs) received weaker votes of confidence, it should be noted that they were still near the 5.5 central point, far from a mandate by the engineering faculty to discontinue them.

The results of subanalyses by "funding source," "region," and "size" may be valuable politically, assisting administrations in knowing whether their school is more predisposed to support the various MEP components, based on their profiles. In general, state schools yielded higher scores than private; regionally, the Midwest was the highest and the East was the lowest; and in terms of size, we found that the larger the school, the higher the score. A brief break-down of profiles and combinations thereof which tended to be most endorsed over another by survey questions follows:

Survey item	This profile or combination	Tends to be stronger than	This profile or combination
General MEP's	State		Private
	Midwest		East
MEP Clubs	Small/State		Small/Private
Scholarships	Small/State		Small/Private
	Mid-size/Private		Mid-size/State
Study Centers	State		Private
Career Fairs	Large		Mid-size
	Non-research-Oriented		Research-Oriented
Awards Banq's	Small/State		Small/Private
	Large/Private		Large/State
	Midwest		Mountain
	Southern		Mountain

Further, note the following extremely high ($\underline{M} > 8.0$) mean responses:

Survey Item	Profile	Mean
General MEP's	Small/State	8.60
Scholarships	Small/State	8.80
	Large/State	8.58
	Medium/Private	9.00
	Large/Private	8.10
	South	8.20
Summer Bridge	Large/State	8.26
	Large/Private	8.00
	Mountain	8.05

Schools which are smaller and private appeared to provide lower evidence of support overall. This may reflect an increased concern for sensitivity, given their smaller classes and increased focus on individual attention. As one respondent wrote, "Care should be taken so other students don't feel they have less attention than MEP students."

Conclusion

Based on recent polls and current news media, it may appear that support of affirmative action measures are waning. In some circles expressions in support of affirmative action are viewed as politically incorrect. Yet, the above results suggest caution should be exercised before succumbing too quickly to this pressure in engineering programs. To the extent that faculty are viewed as the "heart of the academic institution," this evidence of their support should encourage institutions of higher education to continue on the path of such educational equity vehicles as Minority Engineering Programs.

Limitations. Although a considerable wealth of information was obtained in this investigation, the reader is cautioned to treat the findings tentatively. Based upon critical examination of the survey instrument by the authors and some respondents, the following assumptions and limitations should be noted. First, we did not control for the ethnicity of the faculty or for the number and percentage of under-represented students they had in their respective schools. Another factor may have been the wording of the response scale. By denoting "Value and Appropriateness at your Institution," we assumed respondents considered both components jointly, using similar weighting of the two factors when marking their response. We also assumed that professors would circle "N/A" only when they wished to not answer the question. If a Minority Engineering Program or specific components thereof were not appropriate for their

particular school of engineering (given the constituent student body, or its size, for example), we expected the professor to circle a rating on the low end. A final limitation was that we relied on many faculty responses at a few schools, rather than ensuring broader school representation.

Recommendations for further research. As we make important educational and legal decisions such as the reduction or expansion of affirmative action support programs in higher education, there are many important questions which should be carefully examined. What are the opinions of other important participants such as college students and current tax payers? Which components are working? How efficient are they in serving their purpose? How do our findings generalize to other disciplines? This kind of information can assist the American people in the poles as they make legal decisions. It can also assist educational administrators as they set policies and directions within their programs.

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Appendix A
Faculty Questionnaire on Minority Engineering Program

Please assess the value and appropriateness of the existence of a formal, structured, general Minority Engineering Program (#1 below) in your School of Engineering, along with the subsequent specific components (#2-8 below)

1 = Very low, should not exist at all
10 = Very high, critical

	Value and Appropriateness at your Institution Low → High										
1. General Minority Engineering Program:	1	2	3	4	5	6	7	8	9	10	N/A
2. MEP constituent student associations based on gender or ethnicity (e.g., National Society of Black Engineers)	1	2	3	4	5	6	7	8	9	10	N/A
3. MEP Scholarships: *Financial aid*	1	2	3	4	5	6	7	8	9	10	N/A
4. MEP Student Study Center: *Central location for MEP students to study together*	1	2	3	4	5	6	7	8	9	10	N/A
5. Summer Bridge Program: *Summer school program for MEP students to bolster basic math and science skills*	1	2	3	4	5	6	7	8	9	10	N/A
6. Special Tutoring Program:	1	2	3	4	5	6	7	8	9	10	N/A
7. MEP Career Fair:	1	2	3	4	5	6	7	8	9	10	N/A
8. MEP Awards Banquet:	1	2	3	4	5	6	7	8	9	10	N/A

Please list any other specific suggestions or comments of how you would guide your institution in the development of its Minority Engineering Program in seeking to deal with the problem of under-representation of the targeted populations.